A Report Prepared for

Van Waters & Rogers Inc.
6100 Carillon Point
Kirkland, Washington 98033

GROUNDWATER AND SURFACE WATER SAMPLING AND ANALYSIS PLAN PRELIMINARY STUDY AREA BOISE, IDAHO

HLA Job No. 20783 00211

by

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1.0 INTRODUCTION

Harding Lawson Associates (HLA) prepared this sampling and analysis plan (SAP) for Van Waters & Rogers Inc. (VW&R), Kirkland, Washington, to describe the planned investigation in the Preliminary Study Area (PSA), Boise, Idaho (Plate 1). The SAP was prepared as a condition of the Consent Order dated October 9, 1992 (PSA Order), between VW&R and the Idaho Department of Health and Welfare, Division of Environmental Quality (Department).

The scope of work was originally outlined in *Exhibit 1, Work Plan, Preliminary Study Area Investigation, Boise, Idaho (HLA, 1992a)*. The investigation will comprise groundwater sampling and a surface water seepage study. The objective of the groundwater sampling is to evaluate the extent of perchloroethene (Perc) and its degradation compounds (Perc Compounds) in groundwater in the PSA. The objectives of the surface water seepage study are to evaluate the interaction between groundwater and surface water and the potential for surface water contaminant transport, and to develop an understanding of the extent and degree of South Slough Perc contamination. The investigation objectives will be met by sampling selected existing wells and conducting a seepage study in the South Slough.

The background and scope of work for this investigation are presented in Sections 2.0 and 3.0, respectively. A proposed schedule for the investigation is presented in Section 4.0 and references cited in this SAP are listed in Section 5.0. The field procedures to be used for work activities outlined herein are described in the Quality Assurance Project Plan (QAPP) (*HLA, 1992c*).

2.0 BACKGROUND

2.1 Preliminary Study Area

The PSA includes the area northwest of the Boise Towne Square Mall property and is generally bordered by Five Mile and Hampton Roads to the west, Sunflower Lane to the northwest, and the area between Emerald Street and the Union Pacific Railroad to the south (Plate 1). The PSA is further defined in the PSA Order.

Perc was detected in several private wells in the PSA as assessed during the Department's private well sampling conducted in 1988 and 1989 and VW&R's sampling associated with the Consent Order dated January 2, 1992 (Water Supply Order), between VW&R and the Department. The Water Supply Order requires VW&R to determine the area potentially affected by perc contamination (the Preliminary Affected Area [PAA]) and provide alternative water supplies to well owners in the area with Perc concentrations above the EPA Maximum Contaminant Level of 5 micrograms per liter (μg/l). Results of the sampling in the PAA are summarized below. Other investigations have also been performed in the vicinity. A summary of these investigations is presented in the Boise Towne Square Mall Supplemental Investigation and Final Remediation Work Plan (*HLA, 1992b)*. A description of activities to be conducted in the PSA is presented in the Preliminary Study Area Investigation Work Plan (*HLA, 1992a*).

2.2 Groundwater Sampling Summary

2.2.1 State Sampling

In October 1990, the Department initiated a sampling program for the collection and analysis of groundwater samples from the area northwest of the Boise Towne Square Mall. Twenty-four groundwater samples were collected from domestic and supply wells. Of the 24 groundwater samples, 15 contained perc at concentrations ranging from

1.27 to 147 µg/l. The results are further summarized in the Boise Towne Square Mall Supplemental Investigation and Final Remediation Work Plan (*HLA, 1992b*).

2.2.2 Initial Sampling - Water Supply Order

Sampling of 28 private wells was conducted between August 19 and 21, 1992, in the PAA, as defined in the Water Supply Order. The results were presented in a report dated November 17, 1992 (*HLA, 1992d*). Perc was detected in 11 of the 28 well samples at concentrations ranging from 1.6 to 750 micrograms per liter (µg/l). Six of the wells contained Perc concentrations above the detection limit but below the proposed U.S. Environmental Protection Agency (EPA) maximum contaminant level (MCL) of 5 µg/l. These six wells will be resampled on a quarterly basis to verify and monitor the detected Perc concentrations. An additional five wells were proposed for sampling to further evaluate the Perc concentrations in the vicinity of Maple Grove Road in the southern portion of the PAA.

3.0 SCOPE OF WORK

3.1 Groundwater Sampling

To develop an understanding of the extent of Perc Compounds in groundwater, a one-time baseline sampling event will be conducted. In general, the wells proposed for sampling include 4 State of Idaho monitoring wells located near the 140 Milwaukee Avenue area, 2 GZA Geo Environmental monitoring wells on the Mall property, 7 Special Resource Management monitoring wells near the Westpark property, 3 Chen-Northern monitoring wells located near 370 Benjamin Lane, and 14 private wells located in the PAA. The sampling will be coordinated with the assistance of the Department and other parties conducting ongoing groundwater sampling programs within the PSA. Sampling associated with the Water Supply Order activities (private wells) will be conducted concurrently with the PSA sampling in order to gain a more complete understanding of area-wide Perc contamination. This may slightly delay the Water Supply Order resampling and supplemental sampling as described in the *Initial Sampling Report* (*HLA, 1992d*).

The groundwater sampling will be performed by a geologist, hydrogeologist, engineer, or technician under the supervision of an Idaho-registered geologist. Before sampling activities begin, the well owners will be contacted and approval received for the date and time of well sampling. The private wells will be sampled by VW&R and/or HLA. The monitoring wells will be sampled by the party's consultant; split samples will be obtained by HLA.

Sampling methodology for private wells will be a function of well construction and access. In general, the wells will be purged with their installed pumps by running the pump for a minimum of 5 minutes until pH, conductivity, and temperature measurements (indicator parameters) stabilize. Samples will be collected as close to the

wellhead as possible and directly from the discharge line into appropriate sample containers.

Prior to sampling the monitoring wells, groundwater levels will be measured with a chalked steel tape. The wells will then be purged a minimum of three well volumes using a decontaminated bailer or pump. Conductivity, pH, and temperature will be measured at each well during purging. Groundwater and quality assurance/quality control samples will be collected in accordance with procedures and at a frequency specified described in the QAPP *(HLA, 1992c)*.

3.2 Surface Water Seepage Study

To evaluate the interaction between groundwater and surface water and the potential for surface water contaminant transport, and to develop an understanding of the extent and degree of Perc Compound contamination in the South Slough, a seepage study will be conducted. Slough water volumes will be measured and samples collected at seven stations (Table 1). These stations correspond to sampling points from a previous sampling event conducted by the Department (*HLA, 1992b*). The South Slough seepage study will be repeated in the summer during a high flow period to evaluate the seasonal impact on surface water flow.

At each station, a cross-section will be constructed and divided into measurement locations so that an accurate flow can be estimated from multiple measurement locations. Each measurement location is recorded on a data form (Table 2) and represents no more than 10 percent of the cross-sectional area. Stream discharge (volume) is calculated by multiplying the measured flow velocity from the cross-sectional area of the measurement point. The total flow for the location is the

sum of each measurement point. The seepage analysis then compares the discharge at each station to determine whether the slough is losing or gaining water at each station.

Prior to sample collection, conductivity, pH, and temperature will be measured. Samples will be collected by directly filling appropriate sample containers by submerging them at midstream with the open end of the container pointing upstream. QA/QC samples will be collected and all samples will be handled and transported as described in the QAPP *(HLA, 1992c)*.

3.3 Laboratory Analytical Program

As described in the QAPP, groundwater, surface water, and QA/QC samples will be transported via overnight mail under chain of custody to Analytical Technologies, Inc. (ATI), Renton, Washington (*HLA, 1992c*). The samples will be analyzed for Perc Compounds using EPA Test Method 8010.

3.4 Soil Gas Survey

A soil gas survey was originally proposed in the Preliminary Study Area Investigation Work Plan (*HLA, 1992a*). However, no soil gas survey is proposed for the PSA at this time. Existing data and data collected during the baseline sampling event should be sufficient to scope the activities necessary for the Phase II investigation. The objectives of the Phase II investigation are to further characterize the hydrogeology, extent and migration pathway(s) of Perc compounds, and to resolve surface water and groundwater data gaps. These objectives will be met by installing additional monitoring wells, evaluating aquifer parameters, and conducting groundwater and surface water monitoring (*HLA, 1992a*).

4.0 SCHEDULE

Implementation of the field work is scheduled to begin within 21 days of Department approval of this sampling plan. The final results will be submitted to the Department in the Phase I Investigation Report.

5.0 REFERENCES

Harding Lawson Associates, 1992a. *Exhibit 1, Work Plan, Preliminary Study Area Investigation, Boise, Idaho.* September 8.

_____, 1992b. *Exhibit 3, Work Plan, Boise Towne Square Mall Supplemental Investigation and Final Remediation, Boise, Idaho.* September 8.

_____, 1992c. *Quality Assurance Project Plan. Former VW&R Facility, Boise, Idaho.* November 2.

_____, 1992d. *Initial Groundwater Sampling Report, Preliminary Affected Area, Water Supply Order, Boise, Idaho.* November 17.

TABLES

Table 1. Proposed South Slough Surface Water Sampling Stations

Station #	Description
1	South Slough below the air stripper discharge
2	South Slough at Emerald Road
3	South Slough at Ridenbaugh Canal
4	South Slough at Maple Grove
5	South Slough at Irving
6	South Slough at Kimball
7	South Slough at Mitchell

Table 2. Discharge Monitoring Form

Marsh McBirney Model 201 Flowmeter
Data Log Sheet

Date_____ Time_____

HLA
Job/Job#_____

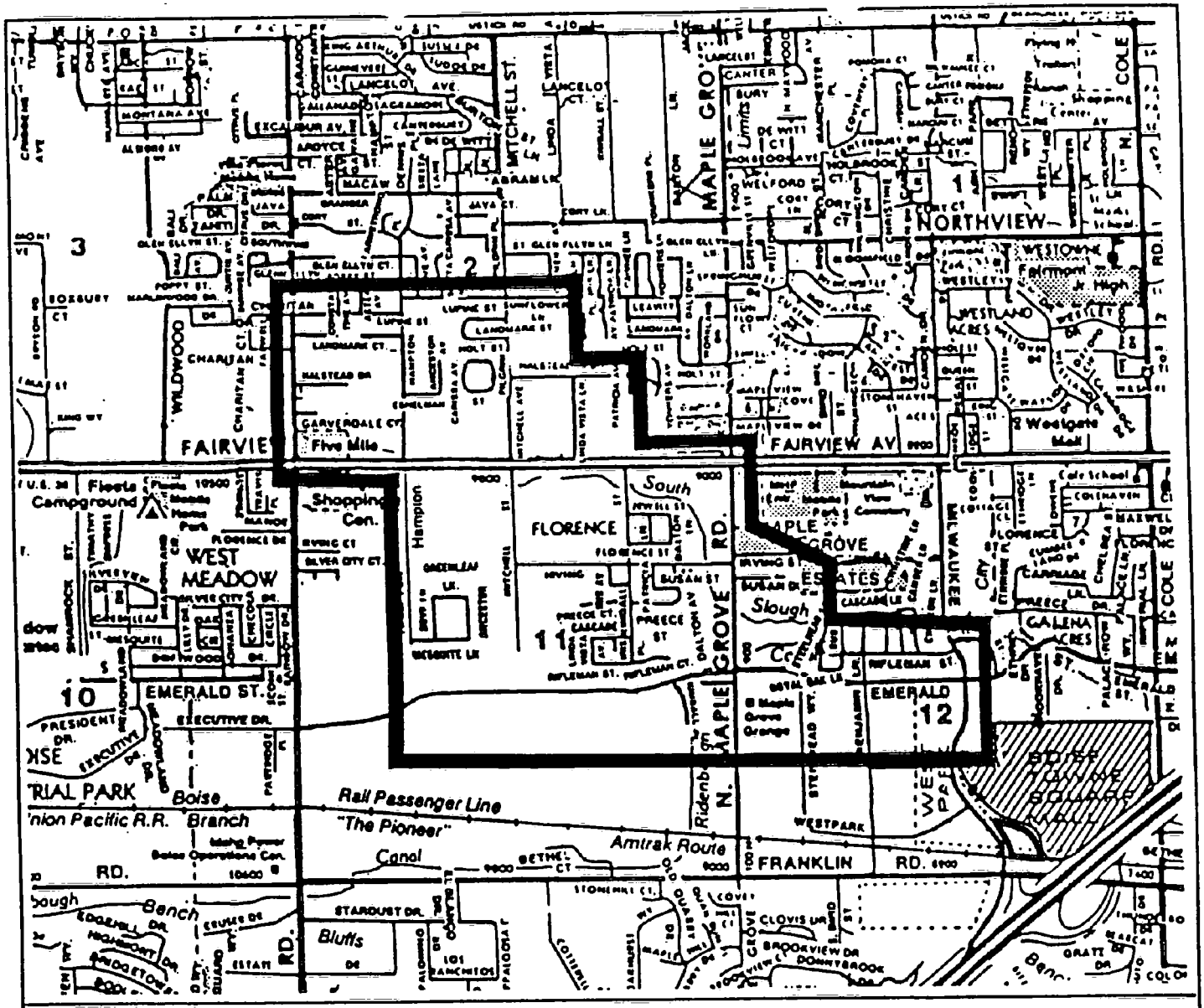
Field
Personnel_____

Environmental Conditions_____

Monitoring Location_____

Field Data							Office Calculations	
Total Flow width (ft)	Station (ft.from edge of flow)	Flow Depth (ft)	Monitoring depth* (ft)	Time period (sec)	Time Conc setting	Velocity reading (ft/s)	Surface width (ft)	Discharge (cfs)
* 6/10 of total depth from surface								
						Total Discharge		

PLATE



REFERENCE: Boise Metro Map, Published by Hunt Enterprises, Boise

EXPLANATION

Mall Investigation Area

Preliminary Study Area

Harding Lawson Associates
Engineering and Environmental Services

Preliminary Study Area
Groundwater and Surface Water
Sampling and Analysis Plan
Boise, Idaho

PLATE **1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
pg	20783 00211		11/92	

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